PATENT
Docket No. 511582000800

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Daniel E. AFAR, et al.

Serial No.: 09/323,597

Filing Date: June 1, 1999

For: NOVEL TUMOR ANTIGEN USEFUL IN DIAGNOSIS AND THERAPY OF PROSTATE AND COLON CANCER

Examiner: Gary B. Nickol, Ph.D.

Group Art Unit: 1642

DECLARATION OF MARY FARIS, PH.D.
CONCERNING NORMAL TISSUE EXPRESSION

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

I, Mary Faris, declare as follows:

1. I hold the position of Group Leader-Target Validation at Agensys, Inc. This position requires me to generate *in vitro* models for the study of cancer, and to investigate the effect of specific genes and gene products on tumor development, growth, and progression. This position also requires me to attend national and international conferences addressing issues in cancer research, conferences where established as well as cutting edge ideas are presented. I have a Ph.D. in Immunology and Microbiology from Ohio State University. In addition, I have held two postdoctoral fellowships, one at the University of Virginia and one at the University of California at Los Angeles, School of Medicine. I have worked in the field of molecular biology

academically and professionally for over 15 years. A copy of my *curriculum vitae* is attached as Exhibit A.

2. This submission is made in support of the proposition that targeted antitumor therapies are useful even when the targeted protein is expressed on normal tissues, what is more even if the normal tissue is from a vital organ. A vital organ is one that is necessary to sustain life, such as the heart or brain. A non-vital organ is one that can be removed whereupon the individual is able to survive without artificial life support. Examples of non-vital organs are ovary, breast, and prostate. The expression and targeting of two exemplary proteins will be discussed, HER2/neu and epidermal growth factor receptor (EGFR).

3. Herceptin® is an FDA approved pharmaceutical that has as its active ingredient an antibody which is immunoreactive with the protein known synonymously as HER2, HER2/neu, or erb-b-2. It is marketed by Genentech and has been a commercially successful antitumor agent. Herceptin sales reached almost $400 million in 2002 (see Exhibit B). The success of Herceptin is indicated by both the volume and trend of its sales figures. During the period it has been marketed, its sales numbers have consistently increased.

4. Herceptin is FDA approved as a treatment for HER2 positive metastatic breast cancer (see Exhibit C). However, the expression of HER2 is not limited to such tumors. The same protein is expressed in a number of normal tissues.

5. The diverse expression of the HER2/neu protein is indicated in Exhibit D.[1] Exhibit D provides data panels for three different GenBank deposits of HER2/neu sequence. The comparative data in Exhibit D show levels of HER2 above the median in numerous normal tissues. In particular, attention is called to the levels present in kidney and heart. The levels in

kidney are consistently shown as higher than those in heart. It is emphasized that these values are for normal tissue; thus these tissues are present in *all human recipients* of Herceptin.

6. The expression of HER2/neu in a diverse array of normal and malignant tissues was corroborated by studies conducted at Agensys, assignee of the present case, by use of RT-PCR (Exhibit F). Again, significant expression of HER2/neu was noted in heart and kidney. Further corroboration of normal expression of HER2/neu by immunohistochemistry is set forth in Exhibit G. In Exhibit G, positive staining for the presence of HER2/neu was found in normal kidney and colon tissue. Additional confirmation of the presence of HER2/neu in normal kidney is provided by Latif, et al.[2] As shown in this article (which evaluated whether renal cell carcinoma should be a preferred indication for anti-HER2 antibodies such as Herceptin), both protein and mRNA are produced in benign renal tissues. Notably, HER2/neu protein was strongly overexpressed in benign renal tissue (see page 8, left hand column last paragraph of Latif, et al.).

7. Despite the fact that HER2/neu is expressed in vital organs such as heart and kidney, Herceptin is very useful, FDA-approved, and commercially successful. The effect of Herceptin on cardiac tissue, i.e., "cardiotoxicity," has been a limited side effect to treatment. When patients were treated with Herceptin alone, a very low percentage of patients had any significant cardiotoxicity.

8. Of particular note, although the data shows that kidney tissue exhibits even higher expression than cardiac tissue, nephrotoxicity has not been an appreciable side effect of Herceptin treatment at all. In fact, of the diverse normal tissues in which HER2 is expressed,

---

[1] The expression data in Exhibit D was established using gene chip technology; see Su, et al, PNAS *Proc. Natl. Acad. Sci. USA*, Vol. 99, Issue 7, 4465-4470, April 2, 2002, Exhibit E. The results for HER2 are available on the GNF Gene Expression Atlas website http://expression.gnf.org/cgi-bin/index.cgi.

[2] Latif, Z., et al., B.J.U. International (2002) 89:5-9 (Exhibit H)

there is very little occurrence of any side effect. Only cardiac tissue has any appreciable side effect at all. A tissue such as kidney, where HER2/neu expression is appreciable, has not been the locus for any side effect.[3]

9. Taken together, this documentation establishes that production of a target protein such as HER2/neu on normal tissue, even vital normal tissue, does not defeat the utility of the protein as a therapeutic for certain tumors in which the protein is also expressed.[4] Such physiologic outcomes, where there is normal tissue expression of a cancer-associated protein target, are not unique to HER2/neu as will be discussed below.

10. Several anti-cancer therapeutic products that target the epidermal growth factor receptor (EGFR) are presently in clinical evaluation.[5] The small molecule product Iressa® received FDA approval[6] in May 2003. The rationale for EGFR-targeted anti-cancer treatments is both well known and well accepted.[7]

11. One EGFR-targeted anti-cancer treatment composition is Erbitux™ (also known as cetuximab or C225). The active ingredient in Erbitux is an antibody which is immunoreactive with the EGFR. Erbitux antibody has been shown to block the proliferation of various cancer cells.[8] The successful use of Erbitux is shown, for example, by a March 2003 $60 million commercialization payment (Exhibit K), as well as very exciting European clinical trial data disclosed in early 2003.[9] This data indicated that Erbitux was able to *affect shrinkage of tumor*

---

[3] See Exhibit C, the product information for Herceptin® for an overview of side effect issues

[4] This is particularly true where the target protein, as with HER2/neu is expressed at higher levels in tumor cells relative to normal tissue. In one embodiment, overexpression in tumor tissue can provide for altered, e.g., enhanced, protein availability for antibody binding.

[5] Baselega, J., Oncologist 7 (supp. 4):2-8 (2002) (Exhibit I)

[6] Iressa attaches itself to the EGF receptor inside the cell, which blocks the activation of tyrosine kinase, and switches off the signals from the EGFR.

[7] Id.

[8] Busam, et al. Br. J. Derm. 144:1169-1176 at 1169 (2001) (Exhibit J)

[9] C. Arnst "The War on Cancer: Good News, Glum Faces" BusinessWeek Online, June 3, 2003 <http://www.businessweek.com/technology/content/jun2003/tc2003063_1032.htm> (Exhibit K)

size by 50%. Tumor size was decreased by 50% in 11% of patients who received Erbitux as a single agent and in 23% of patients who received Erbitux in combination with chemotherapy.[10] In addition, tumor progression was delayed and life span appeared to be increased in the treated cancer patients. These are significant findings for a patient population with dire prognosis, few if any treatment options, and very short life expectancy.

12. EGFR is therefore being used and evaluated as a target for treatment of patients with breast, head and neck, lung, kidney and prostate cancer.[11] However, the expression of EGFR is not limited to such tumors. This protein is expressed in a diverse array of normal tissues.

13. EGFR protein is extensively expressed in adult humans. It is present on all epithelial and stromal cells, select glial and smooth muscle cells,[12] oral and laryngeal mucosa[13]; brain;[14] liver,[15] prostate;[16] placenta;[17] stomach and colon;[18] and, skin.[19] It is to be noted that since it is expressed in these normal tissues, EGFR is present in all human recipients of any EGFR-targeted therapy.

14. Despite the fact that EGFR is expressed in numerous normal tissues, including vital tissues such brain and colon, therapeutics that target EGFR are very useful and are in active development. The only significant side effect of such therapeutics has been on skin as an

---

[10] "Study backs ImClone drug's effectiveness" American Society of Clinical Oncology (ASCO) web page, June 2, 2003 <http://www.asco.org/ac/1,1003,_12-002122-00_18-0028202-00_19-0028203-00_20-001,00.asp> (Exhibit L)
[11] Busam, et al, *supra*
[12] Wells, A., Int. Biochem & Cell Biol. 31:637-643 at 640 (1999) (Exhibit M)
[13] Christensen, M., Dan Med Bull. 45(2):121-134 (Apr. 1998) (Exhibit N)
[14] Ferrer, et al., Prog. Neurobiol. 49(2):99-123 (Jun 1996) (Exhibit O)
[15] Luwar, et al., Cancer Res. 61:5355-5361 (July 15, 2001) (Exhibit P)
[16] De Miguel, et al., Cytokine 11(9):722-727 (Sep 1999) (Exhibit Q)
[17] Mauro, et al., Repro. Fertil. Devel. 7(6): 1465-1470 (1995) (Exhibit R)
[18] Challier and Menard, Frontiers in Biosci. 4:87-101 at sections 4.2 and 4.3 (January 15, 1999) (Exhibit S)
[19] Jost, et al. Eur. J. Dermatol. 10(7):505-510 (Oct-Nov 2000); Luwar, et al., Cancer Res. 61:5355-5361 (July 15, 2001) (Exhibit T)

acneiform rash.[20] This has merely been a side effect to treatment. This side effect is so minor that it is used as an indication that therapeutically effective dosage levels have been achieved.[21] Notably, the side effect is actually capitalized on as a relatively innocuous signal that an individual has achieved a therapeutically effective dose.

15. The data on EGFR establishes that production of a target protein such as EGFR on normal tissue, even vital normal tissues, does not preclude the utility of the protein as a therapeutic for certain tumors in which the protein is also highly expressed.[22]

16. Thus, targeted antitumor therapies are useful even when the targeted protein is expressed on normal tissues, even normal vital organ tissues. The ability to use a cancer-associated protein in this manner is not unique to any particular protein. The existence of expression of a protein on a normal tissue, even a vital organ tissue, still allows for meaningful and successful use of that protein as a therapeutic target.

17. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements are made with the knowledge that willful, false statements and the like so made are

---

[20] Busam, et al, *supra;* Van Doorn, et al., Br. J. Derm. 147:598-601 (2002) (Exhibit U)

[21] Abgenix Press release 20 Aug 2002 <http://ir.abgenix.com/phoenix.zhtml?c=91622&p=IROL-NewsText&t=Regular&id=381536&> (Exhibit V)

[22] See footnote 4, *supra*

punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Executed at Santa Monica, California, on August 21, 2003.

Mary Faris, Ph.D.

MARY FARIS, PH.D. DECLARATION EXHIBITS:

Exhibit A	Mary Faris *curriculum vitae.*
Exhibit B	Herceptin sales figures
Exhibit C	Herceptin product insert
Exhibit D	Tissue expression of the HER2/neu protein.
Exhibit E	Su, et al, PNAS *Proc. Natl. Acad. Sci. USA*, Vol. 99, Issue 7, 4465-4470, April 2, 2002, .
Exhibit F	Expression of HER2/neu in a diverse array of normal and malignant tissues by RT-PCR
Exhibit G	HER2/neu protein expression in normal kidney and colon tissue.
Exhibit H	Latif, Z., et al., B.J.U. International (2002) 89:5-9.
Exhibit I	Baselega, J., Oncologist 7 (supp. 4):2-8 (2002).
Exhibit J	Busam, et al. Br. J. Derm. 144:1169-1176 at 1169 (2001)
Exhibit K	C. Arnst., The War on Cancer: Good News, Glum Faces" Business Week Online 3 June 2003
Exhibit L	"Study backs ImClone drug's effectiveness" ASCO (online) 2 June 2003
Exhibit M	Wells, A., Int. Biochem & Cell Biol. 31:637-643 at 640 (1999)
Exhibit N	Abstract of Christensen, M., Dan Med Bull. 45(2):121-134 (Apr. 1998)
Exhibit O	Abstract of Ferrer, et al., Prog. Neurobiol. 49(2):99-123 (Jun 1996)
Exhibit P	Luwor, et al., Cancer Res. 61:5355-5361 (July 15, 2001)
Exhibit Q	De Miguel, et al., Cytokine 11(9):722-727 (Sep 1999)
Exhibit R	Abstract of Maruo, et al., Repro. Fertil. Devel. 7(6): 1465-1470 (1995)
Exhibit S	Challier and Menard, Frontiers in Biosci. 4:87-101 at sections 4.2 and 4.3 (January 15, 1999)
Exhibit T	Abstract of Jost, et al. Eur. J. Dermatol. 10(7):505-510 (Oct-Nov 2000); Abstract & full copy of Luwor, et al., Cancer Res. 61:5355-5361 (July 15, 2001)
Exhibit U	Van Doorn, et al., Br. J. Derm. 147:598-601 (2002)
Exhibit V	Abgenix Press release - 20 August 2002

MARY FARIS, PH.D.

EDUCATION:

1994-1996: Postdoctoral Fellowship, UCLA School of Medicine.

1991-1994: Postdoctoral Fellowship, University of Virginia.

1991: Ph.D. in Immunology and Microbiology
The Ohio State University
Dissertation Title: Characterization of the Mechanism of Persistent I-A Expression by Macrophages.
Advisor: Dr. Bruce S. Zwilling

1986: B.S. Biology/Chemistry (double major) with Distinction,
University of the State of New York

EXPERIENCE:

1999-present: Agensys Inc.
2001- present: Group Leader, Research Scientist III
1999-2001: Research Scientist II
Research Interests: Functional Validation of Novel and Recently Discovered Genes as Therapeutic Targets for Treatment of Cancer.

1998-1999: Senior Scientist, Incyte Genomics.
Research Interests: Mechanism of Tumor Growth and Progression.
Integrated approach to Cancer Biology and Therapeutic Intervention

1996-1998: Assistant Researcher, Faculty, UCLA School of Medicine.
Research Interests: Mechanism of T cell Activation and Apoptosis.
Integration of multiple factors in the angiogenesis/tumorigenesis of Kaposi's sarcoma lesions.

1994-1996: Postdoctoral Fellow, UCLA School of Medicine.
Sponsor: Dr. A. Nel.
Research Interests: Signaling Pathways Mediating T cell Activation.
Signaling Pathways Involved in the Growth of Kaposi's Sarcoma tumors.

1991-1994: Postdoctoral Fellow, University of Virginia.
Sponsor: Dr. S. M. Fu.
Research Interests: CD40-Mediated Signal Transduction in lymphocytes.

1989-1991: Graduate Research Associate, The Ohio State University.

Sponsor: Dr. B. Zwilling
Research Interests: Regulation of MHC class II Expression by IFNγ-mediated Pathways.

1987-1989: Teaching Assistant. The Ohio State University.

PUBLICATIONS:

1. Faris M. and B.S. Zwilling. Somatic Cell Hybrids between Macrophages from Bcg^r and Bcg^s Mice: Characterization of MHC Class II Expression. Cellular Immunology, 1990, 127:120.

2. Faris M. and B.S. Zwilling. Characterization of the Persistent I-A Expression by Macrophages from Bcg^r Mice. J. Leuk. Biol., 1990, 49:289.

3. Zwilling B.S., M. Dinkins, R. Christner, M. Faris, A. Griffin, M. Hillberger, M. McPeek and D. Pearl. Restraint Stress Induced Suppression of MHC Class II Expression by Murine Peritoneal Macrophages. J. Neuroimmunology, 1990, 29:125.

4. Zwilling B.S., D. Brown, R. Christner, M. Faris, M. Hillberger, C. Van Epps and B.A. Hartaub. Differential Effect of Restraint Stress on MHC Class II Expression by Murine Peritoneal Macrophages. Brain Behavior and Immunity, 1990, 4:330.

5. Faris M. and B.S. Zwilling. Characterization of the Induction of Persistent MHC class II Expression by Hybrids of Macrophages from Bcg^r and Bcg^s Mice. Euro. J. Immunol., 1991, 21:1047.

6. Faris M., F. Gaskin, R.S. Geha and S.M. Fu. Tyrosine Phosphorylation Defines a Unique Transduction Pathway in Human B Cells Mediated via CD40. Trans. Assoc. Amer. Phys. 1993, 106:187.

7. Brown D., M. Faris, M. Hilburger and B.S. Zwilling. The Induction of Persistent I-A Expression by Macrophages from Bcg^r Mice Occurs via a Protein Kinase C Dependent Pathway. J. Immunol., 1994, 152:1323.

8. Faris M., F. Gaskin, J.T. Parsons and S.M. Fu. CD40 Signaling Pathway: Anti-CD40 mAb Induces Rapid Dephosphorylation and Phosphorylation of Tyrosine-Phosphorylated Proteins Including Protein Tyrosine Kinase Lyn, Fyn and Syk and the Appearance of a 28kD Tyrosine Phosphorylated Protein. J. Exp. Med., 1994, 179:1923.

9. Faris, M., B. Ensoli, N. Stahl. G. Yancopoulos, A. Nguyen, S. Wang and A. Nel. Differential Activation of the ERK, JNK and JAK-Stat Pathways by Oncostatin M and Basic Fibroblast Growth Factor in AIDS-Related Kaposi's Sarcoma cells. AIDS, 1996, 10:370.

10. Faris, M., N. Kokot, L. Lee and A.E. Nel. Regulation of IL-2 transcription by inducible stable expression of dominant negative and dominant active MEKK-1 in Jurkat T cells. Evidence

for the importance of Ras in a pathway which is controlled by dual receptor stimulation. J. Biol. Chem., 1996, 271:27366.

11. Faris, M., N. Kokot, N. Stahl and A.E. Nel. Involvement of Stat3 in Interleukin-6-induced IgM production in a human B cell line. Immunol., 1997, 90:350.

12. Faris, M., B. Ensoli, N. Kokot and A.E. Nel. Inflammatory Cytokines Induce AP-1 Response Elements: Activation of the bFGF promoter and expression of various bFGF isoforms in Kaposi sarcoma and endothelial cells. AIDS, 1998, 12:19.

13. Faris, M., N. Kokot, K. Latinis, S. Kasibhatla, D. Green, G. Koretzky and A.E. Nel. The JNK Cascade Plays a Role in Stress-induced Apoptosis in Jurkat Cells by Upregulating FasL Expression. J. Immunol, 1998, 160:134.

14. Faris, M., B. Ensoli, J. Said, N. Kokot and A.E. Nel. Dominant active Ras affects the life-span, growth factor production and induces Kaposi's sarcoma characteristics in endothelial cells. Cancer Res., 1997, submitted.

15. Ng, D., N. Kokot, M. Faris, A. Saxon and A. Nel. Macrophage Activation by Polycyclic Aromatic Hydrocarbons: Evidence for the involvement of stress-activation protein kinases, AP-1 and anti-oxidant response elements. J. Immunol., 1998, 161: 942.

16. Faris, M., K. M. Latinis, S. Kempiak, G. A. Koretzky and Andre Nel. Stress-Induced Fas Ligand Expression in T cells is Mediated Through A MEKK1-Regulated Response Element in the Fas Ligand Promoter. Mol. Cell. Biol., 1998,18: 5414.

17. Shau, H., A.C. Huang, M. Faris, R. Nazarian., J. de Vellis and W. Chen. Thioredoxin peroxidase (natural killer enhancing factor) regulation of activator protein-1 function in endothelial cells. Biochem. Biophys. Res.Commun. 1998, 249: 683.

18. Abreu-Martin, M., A. Palladino, M. Faris, N. Carramanzana, A. Nel, and S.R. Targan. Fas Activates the JNK pathway in Human Colonic Epithelial Cells: Lack of a Direct Role on Apoptosis. Am. J. Physiol., 1999, 276: 599.

ABSTRACTS:

1. M. Faris and B.S. Zwilling. Characterization of MHC Class II Expression by Macrophage-Hybrids. J. Leuk. Biol. 46: 314(86), 1989.

2. M. Faris and B.S. Zwilling. Regulation of the Induction of Persistent Ia Expression by Macrophages from Mice that are Resistant to Mycobacterium bovis Strain (BCG). FASEB, 4:1752, 1990.

3. M. Faris and B.S. Zwilling. Continuous Expression of MHC class II Glycoproteins by Macrophage-Hybrids: Regulation of the Induction of the Bcg Gene. Proc. Biomed. Res. Society, 1990.

4. B.S. Zwilling and M. Faris. Characterization of the Induction of Persistent I-A Expression by Macrophages from Bcg^r Mice. J. Leuk. Biol., 48:52, 1990.

5. M. Faris and B.S. Zwilling. The Induction of Persistent Expression of MHC Class II (I-A) Glycoproteins is Mediated by Protein Kinase C (PK-C). FASEB, 5:5614, 1991.

6. M. Faris. The Induction of Persistent MHC class II Expression by rIFN-γ is Dependent on a Protein Kinase C Mediated Pathway. The Graduate Research Forum (OSU), 1991.

7. M. Faris, F. Gaskin, R. S. Geha and S. M. Fu. Phosphorylation of a 28kD Protein by a CD40 Mediated Tyrosine Kinase Pathway. J. Immunol., 150:556, 1993.

8. M. Faris, F. Gaskin, R. S. Geha and S. M. Fu. Tyrosine Phosphorylation Defines a Unique Transduction Pathway in Human B Cells Mediated via CD40. Clinical Research, 41:277A, 1993.

9. M. Faris and S.M. Fu. CD40 Signal Transduction: Association of CD40 with Lyn, PI3K, GAP and PLCγ. Clinical Research, 42:206A, 1994.

10. M. Faris, S. Wang and A. Nel. The Oncostatin M Induced Proliferative Response in Kaposi's Sarcoma Cells Involves Adaptor Proteins, Raf-1 and MEK-1. Molecular Pathogenesis and Immunology of HIV-1, 1994.

11. M. Faris, S. Wang, A. Nguyen and A. Nel. The Oncostatin M Response in Kaposi's Sarcoma Cells Involves JAKs, Adaptor Proteins, Raf-1 and MEK-1. FASEB, 9:202A, 1995.

12. A. Nel, M. Faris, F. Xu and N. Kokot. IL-4 and IL-6 Utilize Distinct JAK/Stat Pathways to Drive B-cell Differentiation as Determined at the Level of Ig Genes. Cell Growth Symposium, 1996.

13. M. Faris, N. Kokot, L. Lee and A.E. Nel. Regulation of IL-2 Transcription by the JNK Pathway in Jurkat Cells. J. All. Clin. Immunol., 99: LB53, 1997.

14. M. Faris, N. Kokot, K. Latinis, G. A. Koretzky and A.E. Nel. Role of the JNK cascade in stress-induced apoptosis of Jurkat T cells. FASEB J., 12:930A, 1998.

15. A.E. Nel, A. Saxon, D. Ng and M. Faris. Macrophage activation by polycyclic aromatic hydrocarbons: evidence for the involvement of stress-activated protein kinases, AP-1 and anti-oxidant response elements. FASEB J., 12:1062A, 1998.

16. M. Faris, B. Goka and S. Stuart. Gene expression in breast cancer. Clin. Chem. 45: 10, 1999.

17. A. Raitano, I. Vivanco, R. Hubert, E. Chen, M. Faris, D. Saffran, D. Afar and A. Jakobovits. Auto-catalytic cleavage of the androgen regulated TMPRSS2 protease results in its

secretion by prostate and colon cancer epithelia. Proc. Amer. Assoc. Cancer Res. 42: 657, 2001

18. M. Faris, P. Velasquez, R. Hubert, D. Saffran, A. Raitano and A. Jakobovits. Validation of STEAP-1 as a therapeutic target.

19. M. Faris, P. Velasquez, P Nolan, R. Hubert, A. Raitano and A. Jakobovits. Validation of STEAP-1 as a Cell Surface Cancer Therapeutic Target. Proc. Amer. Assoc. Cancer Res. 43: 947, 2002.

PAPERS PRESENTED AT MEETINGS:

26th Annual Meeting, Society of Leukocyte Biology, October 15-18, 1989, Marco Island, FL, by M. Faris and B.S. Zwilling.

16th Annual ICSABER Graduate Research Forum, May 8, 1990, OSU, Columbus, OH, by M. Faris and B.S. Zwilling.

American Society for Biochemistry and Molecular Biology, The American Association of Immunologists Joint Meeting (FASEB), June 4-7, 1990, New Orleans, LA, by M. Faris and B.S. Zwilling.

27th Annual Meeting, Society of Leukocyte Biology, Twelfth International RES Congress, October 14-18, 1990, Heraklion, Crete, Greece by B.S. Zwilling and M. Faris.

Immunology of Mycobacterial Infections, National Jewish Center of Immunology and Respiratory Medicine, October 1990, Denver, Colorado, by B.S. Zwilling and M. Faris.

Federation of American Societies for Experimental Biology, April 21-25, 1991, Atlanta, GA, by M. Faris and B.S Zwilling.

5th Annual Graduate Research Forum, April 20, 1991, Fawcett Center, Columbus, OH., by M. Faris.

12th Annual Research Day, Department of Medicine, April 26, 1993, OMNI Hotel, Charlottesville, VA, by M. Faris

AAP/ASCI/AFCR Clinical Research Meeting, April 30-May 3, 1993, Washington DC by M. Faris, F. Gaskin, R.S. Geha and S.M. Fu.

American Association of Immunologists, The Clinical Immunology Society Joint Meeting (FASEB), May 21-25, 1993, Denver, Colorado, by M. Faris, F. Gaskin, R.S. Geha and S.M. Fu.

13th Annual Research Day in Internal Medicine, April 25, 1994, OMNI Hotel, Charlottesville, VA, by M. Faris.

AAP/ASCI/AFCR Clinical Research Meeting, April 29-May 2, 1994, Baltimore, MD by M. Faris and S.M. Fu.

Annual UCLA AIDS Institute Symposium: Molecular Pathogenesis and Immunobiology of HIV-1, November 11, 1994, Loews Santa Monica, CA by M. Faris

Federation of American Societies for Experimental Biology, April 9-13, 1995, Atlanta, GA by M. Faris, S. Wang, A. Nguyen and A. Nel.

UK-RSA Symposium on Cell Growth Control, January 28-February 1, 1996, Cape Town, RSA by A. Nel, M. Faris, F. Xu and N. Kokot.

AAAI/AAI/CIS Joint Meeting, February 21-26, 1997, San Francisco, by M. Faris, N. Kokot, L. Lee and A.E. Nel.

Federation of American Societies for Experimental Biology, April 18-22, 1998, San Francisco, by M. Faris, N. Kokot, K. Latinis, G. A. Koretzky and A.E. Nel

SEMINARS AS PRESENTER

Department of Microbiology, The Ohio State University, May 30, 1991. Induction of persistent MHC class II expression by macrophages.

Department of Rheumatology, University of Virginia, February 9, 1994. Update in CD40 mediated signaling: Involvement of PTK, PTP and PI3K.

Jonsson Cancer Center, UCLA, February 22, 1996. Involvement of the Stat pathway in B cell differentiation.

Department of Rheumatology, UCLA School of Medicine, October 30, 1996. Role of the JNK cascade in the regulation of IL-2 production in T lymphocytes.

Jonsson Cancer Center, UCLA, December 12, 1996. Regulation of IL-2 expression in Jurkat cells by MEKK1.

Jonsson Cancer Center, UCLA, October 28, 1997. Role of the JNK cascade in the apoptosis of T cells.

EuroCancer 1998, Paris, June 4, 1998. Integrated Approach to the Discovery of Cancer Therapeutics.

American Association of Clinical Chemists-Baychem 99, San Francisco, September 24, 1999. Expression Analysis of Cancer Genes.

HONORS AND AWARDS:

Honors Tuition Scholarship 1985-1986
ICSABER Graduate Forum Award, 1990.
AFCR Trainee Investigation Award, 1993.

GRANTS AND FUNDING

1. NIH-Tumor Immunology Training Grant, 1994. Title: Regulation of Signaling Pathways in Kaposi's Sarcoma. $27,000.
2. NIH-Tumor Immunology Training Grant, 1995. Title: Regulation of Signaling Pathways in Kaposi's Sarcoma. $29,000.
3. NIH Program Project Grant R and D 19, 1998. Title: Role of the JNK Pathway in SLE. $60,000

PROFESSIONAL AFFILIATIONS:

Society for Leukocyte Biology.
American Federation for Clinical Research.
American Association for the Advancement of Science
American Association of Immunologists
Jonsson Cancer Center